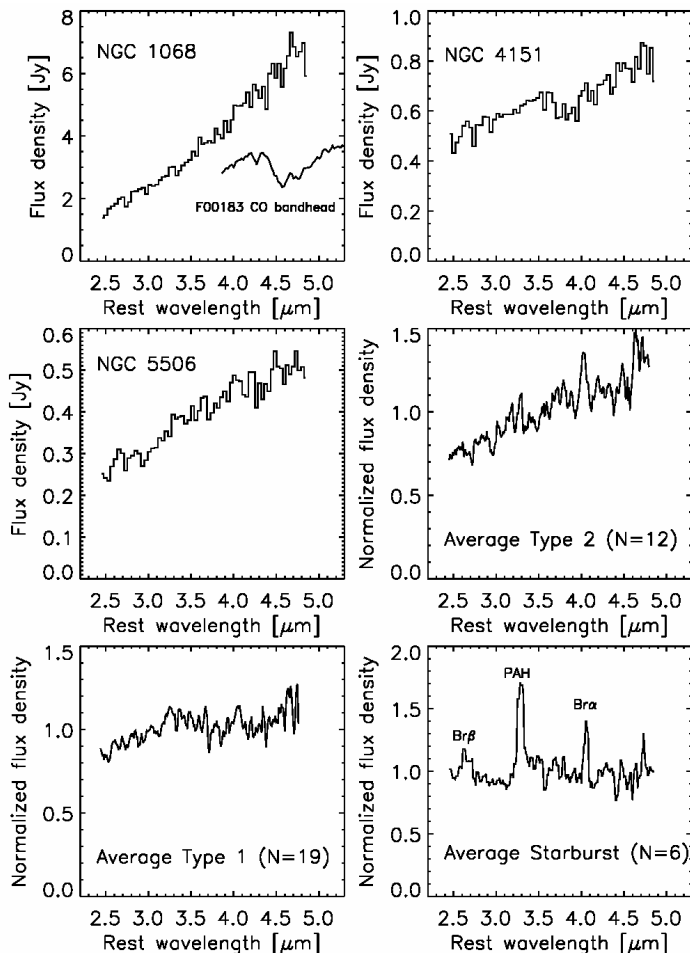




In order to constrain the properties of dense and warm gas around active galactic nuclei, we have searched Infrared Space Observatory spectra of local active galactic nuclei (AGN) for the signature of the 4.7 μ m fundamental ro-vibrational band of carbon monoxide. Low resolution ISOPHOT-S spectra of 31 AGN put upper limits on the presence of wide absorption bands corresponding to absorption by large columns of warm and dense gas against the nuclear dust continuum. High resolution ($R\sim 2500$) ISO-SWS spectra of NGC 1068 detect no significant absorption or emission in individual lines, to a 3σ limit of 7% of the continuum.

The limits set on CO absorption in local AGN are much lower than the recent Spitzer Space Telescope detection (Spoon et al. 2004) of strong CO absorption by dense and warm gas in the obscured ultraluminous infrared galaxy IRAS F00183-7111, despite evidence for dense material on parsec scales near an AGN in both types of objects. This suggests that such deep absorptions are not intimately related to the obscuring 'torus' material invoked in local AGN, but rather are a signature of the peculiar conditions in the circumnuclear region of highly obscured infrared galaxies like IRAS F00183-7111. They may reflect fully covered rather than torus geometries.



2.5-5 μ m Infrared Space Observatory spectra of several bright local AGN, together with average spectra of Type 2 AGN, Type 1 AGN, and starbursts.

The insert in the top left panel shows the detection of a strong absorption due to a large column of warm CO in the obscured ULIRG IRAS F00183-7111 (Spoon et al. 2004).

The spectra of local AGN do not show this feature, despite evidence for dense material on pc scales in both cases.

References:

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- Spoon, H.W.W., Armus, L., et al. 2004, ApJS, in press (Spitzer Special Issue)